

**UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE**

**ECOLOGICAL SITE DESCRIPTION**

**ECOLOGICAL SITE CHARACTERISTICS**

Site Type: Rangeland

Site ID: R042XC003NM

Site Name: Loamy Sand

Precipitation or Climate Zone: 8 to 13 inches

Phase: \_\_\_\_\_

## PHYSIOGRAPHIC FEATURES

### Narrative:

This site occurs on upland plains between drainageways. Slopes are nearly level to undulating, usually less than 9 percent. Low stabilized dunes may occur occasionally. Direction of slopes varies and is not usually significant. Elevations range from 2,500 to 4,500 feet.

### Land Form:

1. Fan

2. Alluvial flat

3.

### Aspect:

1. N/A

2.

3.

	Minimum	Maximum
Elevation (feet)	2,500	4,500
Slope (percent)	0	9
Water Table Depth (inches)	N/A	N/A
Flooding:	Minimum	Maximum
Frequency	N/A	N/A
Duration	N/A	N/A
Ponding:	Minimum	Maximum
Depth (inches)	N/A	N/A
Frequency	N/A	N/A
Duration	N/A	N/A

### Runoff Class:

Negligible to High depending on slope.

## CLIMATIC FEATURES

### Narrative:

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity-short duration thunderstorms.

Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.

The average frost-free season is 207 to 220 days. The last killing frost being late March or early April and the first killing frost being in later October or early November.

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest from January through June, which accelerates soil drying during a critical period for cool season plant growth.

	Minimum	Maximum
Frost-free period (days):	180	221
Freeze-free period (days):	199	240
Mean annual precipitation (inches):	10.0	13.0

### Monthly moisture (inches) and temperature (°F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January	0.40	0.42	20.6	59.7
February	0.40	0.41	25.2	65.6
March	0.41	0.43	31.4	72.7
April	0.58	0.63	40.4	81.5
May	1.28	1.35	49.6	88.7
June	1.40	1.46	59.1	95.4
July	1.62	1.64	63.3	96.4
August	1.79	1.84	61.6	94.8
September	1.81	2.20	54.1	88.5
October	1.16	1.41	40.7	80.4
November	0.43	0.47	28.4	68.7
December	0.48	0.51	20.9	61.1

### Climate Stations:

- (1) NM0600, Artesia, NM - Period of record 1961 - 1990
- (2) NM0992, Bitter Lakes WL Refuge, NM - Period of record 1961 - 1990
- (3) NM1469, Carlsbad, NM - Period of record 1961 - 1990
- (4) NM293792, Hagerman, NM - Period of record 1961 - 1990
- (5) NM299563, Waste Isolation Plant, NM - Period of record 1961 - 1990
- (2) NM4346, Jal, NM - Period of record 1961 - 1990

## INFLUENCING WATER FEATURES

### Narrative:

This site is not influenced from water from wetlands or streams.

### Wetland description:

System	Subsystem	Class
N/A		

### If Riverine Wetland System enter Rosgen Stream Type:

N/A

## REPRESENTATIVE SOIL FEATURES

### Narrative:

The soils on this site are deep and well drained. The surface texture varies from fine sand to loamy fine sand to a depth of 20 to 30 inches. Underlying layers are fine sandy loam or sandy clay loam. Some layers high in lime or with caliche fragments may occur at depths of 20 to 30 inches. These soils have a moderately rapid to moderate permeability. Available water holding capacity is medium to high. Moisture that falls on this site is readily absorbed and can be stored in the lower part of the root zone. These soils, if unprotected by plant cover and organic residue, become wind blown and low hummocks are formed.

Parent Material Kind: Alluvium

Parent Material Origin: Mixed

### Surface Texture:

1. Fine sand
2. Loamy
3. Loamy fine sand

### Surface Texture Modifier:

1. N/A
2.
3.

Subsurface Texture Group:	N/A
Surface Fragments <=3" (% Cover):	N/A
Surface Fragments >3" (% Cover):	N/A
Subsurface Fragments <=3" (%Volume):	4 to 12
Subsurface Fragments >=3" (%Volume):	N/A

Drainage Class:	Minimum Well	Maximum Well
Permeability Class:	Moderately slow	Moderate
Depth (inches):	>72	>72
Electrical Conductivity (mmhos/cm):	2.0	4.0
Sodium Absorption Ratio:	N/A	N/A
Soil Reaction (1:1 Water):	6.6	8.4
Soil Reaction (0.1M CaCl2):	N/A	N/A
Available Water Capacity (inches):	5	5
Calcium Carbonate Equivalent (percent):	N/A	N/A

## PLANT COMMUNITIES

### Ecological Dynamics of the Site:

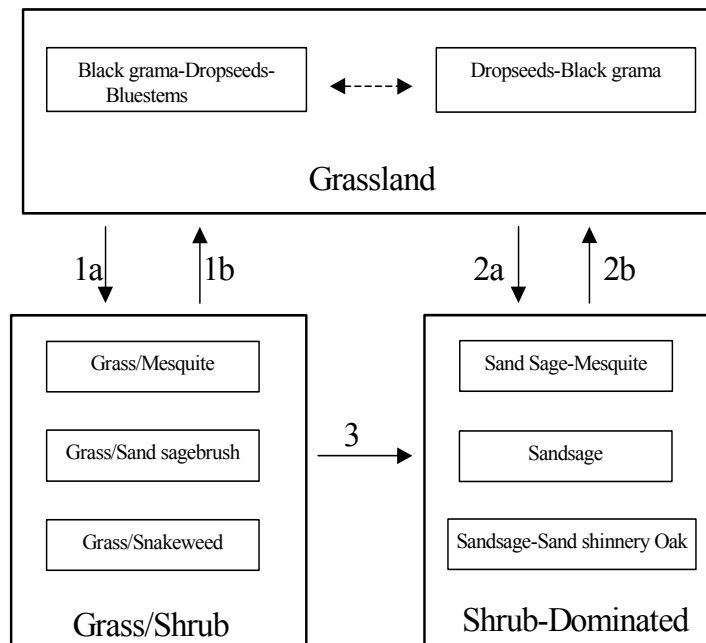
#### Overview

The Loamy Sand site intergrades with the Deep Sand and Sandy sites (SD-3). These sites can be differentiated by surface soil texture and depth to a textural change. Loamy Sand and Deep Sand sites have coarse textured (sands and loamy sand) surface soils while Sandy sites have moderately coarse textured (sandy loam and fine sandy loam) surfaces. Although Loamy Sand and Deep Sand sites have similar surface textures, the depth to a textural change is different—Loamy Sand sub-surface textures typically increase in clay at approximately 20 to 30 inches, and Deep Sand sites not until around 40 inches.

The historic plant community of Loamy Sand sites is dominated by black grama (*Bouteloua eriopoda*), dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*), and bluestems (*Schizachyrium scoparium* and *Andropogon hallii*), with scattered shinnery oak (*Quercus havardii*) and sand sage (*Artemisia filifolia*). Perennial and annual forb abundance and distribution are dependent on precipitation. Litter and to a lesser extent, bare ground, are a significant proportion of ground cover while grasses compose the remainder. Decreases in black grama indicate a transition to either a grass/shrub or shrub-dominated state. The grass/shrub state is composed of grasses/honey mesquite (*Prosopis glandulosa*), grasses/broom snakeweed (*Gutierrezia sarothrae*), or grasses/sand sage. The shrub-dominated state occurs after a severe loss of grass cover and a prevalence of sand sage with secondary shinnery oak and mesquite. Heavy grazing intensity and/or drought are influential drivers in decreasing black grama and bluestems and subsequently increasing shrub cover, erosion, and bare patches. Historical fire suppression also encourages shrub pervasiveness and a competitive advantage over grass species (McPherson 1995). Brush and grazing management, however, may reverse grass/shrub and shrub-dominated states toward the grassland-dominated historic plant community.

## Plant Communities and Transitional Pathways (diagram):

### MLRA-42, SD-3, Loamy Sand



1a. Drought, over grazing, fire suppression.

1b. Brush control, prescribed grazing

2.a Severe loss of grass cover, fire suppression, erosion.

2b. Brush control, seeding, prescribed grazing.

3. Continued loss of grass cover, erosion.

## Plant Communities Photo Display & Descriptive Diagnosis

### MLRA 42; SD-3; Loamy Sand

#### Grass/Shrub



- Black grama/Mesquite community, with some dropseeds, threeawns, and scattered sand shinnery oak
- Grass cover low to moderate

#### Shrub-Dominated



- Sand Sage/Sand shinnery oak community, with some yucca, dropseeds, threeawns, and black grama
- Grass cover low
- Bare patches evident

#### Shrub-Dominated



- Sand sagebrush community, with some dropseeds, bluestems, and a few scattered mesquite
- Grass cover low
- Bare patches expanding
- Pajarito loamy fine sand, Eddy Co., NM



Plant Community Name: Historic Climax Plant Community

Plant Community Sequence Number: 1 Narrative Label: HCPC

### State Containing Historic Plant Community

**Grassland:** The historic plant community is a uniformly distributed grassland dominated by black grama, dropseeds, and bluestems. Sand sage and shinnery oak are evenly dispersed throughout the grassland due to the coarse soil surface texture. Perennial and annual forbs are common but their abundance and distribution are reflective of precipitation. Bluestems initially, followed by black grama, decrease with drought and heavy grazing intensity. Historical fire frequency is unknown but likely occurred enough to remove small shrubs to the competitive advantage of grass species. Fire suppression, drought conditions, and excessive grazing drive most grass species out of competition with shrub species.

Diagnosis: Grassland dominated by black grama, dropseeds, and bluestems. Shrubs, such as sand sage, shinnery oak, and mesquite are dispersed throughout the grassland. Forbs are present and populations fluctuate with precipitation variability.

#### Ground Cover (Average Percent of Surface Area).

Grasses & Forbs	<u>28</u>
Bare ground	<u>22</u>
Surface cobble and stone	<u>0</u>
Litter (percent)	<u>50</u>
Litter (average depth in cm.)	<u>1</u>

#### Plant Community Annual Production (by plant type):

Plant Type	Annual Production (lbs/ac)		
	Low	RV	High
Grass/Grasslike	442	833	1224
Forb	110	208	306
Tree/Shrub/Vine	98	184	270
Lichen			
Moss			
Microbiotic Crusts			
Totals	650	1225	1800

Plant Community Composition and Group Annual Production: Plant species are grouped by annual production **not** by functional groups.

Plant Type - Grass/Grasslike

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	SCSC	little bluestem	61 - 123	61 - 123
2	ANHA	sand bluestem	37 - 61	37 - 61
3	BOSA	silver bluestem	37 - 61	37 - 61
3	BOBA3	cane bluestem		
4	BOER4	black grama	123 - 184	123 - 184
4	MUPO2	bush muhly		
5	SEVU2	plains bristlegrass	123 - 184	123 - 184
5	URCI	signal grass		
5	PASE5	sand paspalum		
6	SPCR	sand dropseed	123 - 184	123 - 184
6	SPCO4	spike dropseed		
6	SPFL2	mesa dropseed		
7	DICOA	fall witchgrass	61 - 123	61 - 123
7	CHCU2	hooded windmill		
7	DICA8	Arizona cottontop		
8	SPGI	giant dropseed	37 - 61	37 - 61
8	HENE5	New Mexico feathergrass		
9	2GP	other perennial grasses	37 - 61	37 - 61

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
10	ARFI2	sand sagebrush	61 – 123	61 – 123
10	QUHA3	shinnery oak		
11	ATCA2	fourwing saltbush	37 - 61	37 - 61
11	DAFO	feather dalea		
12	EPHED	ephedra spp.	37 - 61	37 - 61
12	KRER	range ratany		
13	2SHRUB	other shrubs	37 - 61	37 - 61

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
14	CRPOP	leather croton	61 - 123	61 - 123
14	SPHAE	globemallow		
14	GAPU	Indian blanket flower		
15	PACAL5	wooly groundsel	12 - 37	12 - 37
16	PLPA2	wooly Indianwheat	61 - 123	61 - 123
16		Deerstongue		
16	DIWI2	spectaclepod		
17	2FORB	other forbs	37 - 61	37 - 61

Plant Type - Lichen

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Moss

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Type - Microbiotic Crusts

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production

Plant Growth Curves

Growth Curve ID NM2803

Growth Curve Name: HCPC

Growth Curve Description: SD-3 Loamy Sand - Warm season plant community

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	3	5	10	10	25	30	12	5	0	0

## **Additional States**

**Grass/Shrub State:** The grass/shrub state is dominated by communities of grasses/mesquite, grasses/snakeweed, or grasses/sand sage. Decreases in black grama and bluestem species lead to an increase in bare patches and mesquite which further competes with grass species. An increase of dropseeds and threeawns occurs. Grass distribution becomes more patchy with an absence or severe decrease in black grama and bluestems. Mesquite provides nitrogen and soil organic matter to co-dominant grasses (Ansley and Jacoby 1998, Ansley et al. 1998). Mesquite mortality when exposed to fire is low due to aggressive resprouting abilities. Herbicide application combined with subsequent prescribed fire may be more effective in mesquite reduction (Britton and Wright 1971).

Diagnosis: This state is dominated by an increased abundance of communities including grass/mesquite, grass/snakeweed, or grass/sand sage. Dropseeds and threeawns have a patchy distribution.

**Transition to Grass/Shrub State (1a):** The historic plant community begins to shift toward the grass/shrub state as drivers such as drought, fire suppression, interspecific competition, and excessive grazing contribute to alterations in soil properties and herbaceous cover. Cover loss and surface soil erosion are initial indicators of transition followed by a decrease in black grama with a subsequent increase of dropseeds, threeawns, mesquite, and snakeweed. Snakeweed has been documented to outcompete black grama especially under conditions of fire suppression and drought (McDaniel et al. 1984).

Key indicators of approach to transition:

- Loss of black grama cover
- Surface soil erosion
- Bare patch expansion
- Increased dropseed/threeawn and mesquite, snakeweed, or sand sage abundances

**Transition to Historic Plant Community (1b):** Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community.

**Shrub-Dominated State:** The shrub-dominated state results from a severe loss of grass cover. This state's primary species is sand sage. Shinnery oak and mesquite also occur; however, grass cover is limited to intershrub distribution. Sand sage stabilizes light sandy soils from wind erosion, which enhances protected grass/forb cover (Davis and Bonham 1979). However, shinnery oak also responds to the sandy soils with dense stands due to an aggressive rhizome system. Shinnery oak's extensive root system promotes competitive exclusion of grasses and forbs. Sand sage, shinnery oak, and mesquite can be controlled with herbicide (Herbel et al. 1979, Pettit 1986).

**Transition to Shrub-Dominated (2a):** Severe loss of grass species with increased erosion and fire suppression will result in a transition to a shrub-dominated state with sand sage, Shin oak, and honey mesquite directly from the grassland-dominated state.

Key indicators of approach to transition:

- Severe loss of grass species cover
- Surface soil erosion
- Bare patch expansion
- Increased sand sage, shinnery oak, and mesquite abundance

**Transition to Historic Plant Community (2b):** Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community. In addition, seeding with native grass species will augment the transition to a grassland-dominated state.

**Transition to Shrub-Dominated (3):** If the grass/shrub site continues to lose grass cover with soil erosion, the site will transition to a shrub-dominated state with sand sage, shinnery oak, and honey mesquite.

Key indicators of approach to transition:

- Continual loss of dropseeds/threawns cover
- Surface soil erosion
- Bare patch expansion
- Increased sand sage, shinnery oak, and mesquite/dropseed/threawn and mesquite/snakeweed abundance

## ECOLOGICAL SITE INTERPRETATIONS

### Animal Community:

This Ecological Site provides habitat which supports a resident animal community that is characterized by pronghorn antelope, desert cottontail, spotted ground squirrel, black-tailed prairie dog, yellow faced pocket gopher, Ord's kangaroo rat, northern grasshopper mouse, southern plains woodrat, badger, roadrunner, meadowlark, burrowing owl, white necked raven, lesser prairie chicken, morning dove, scaled quail, Harris hawk, side blotched lizard, marbled whiptail, Texas horned lizard, western diamondback rattlesnake, dusty hognose snake and ornate box turtle.

Where mesquite has invaded, most resident birds and scissor-tailed flycatcher, morning dove and Swainson's hawk, nest. Vesper and grasshopper sparrows utilize the site during migration.

### Hydrology Functions:

The runoff curve numbers are determined by field investigations using hydraulic cover conditions and hydrologic soil groups.

Hydrologic Interpretations	
Soil Series	Hydrologic Group
Berino	B
Kinco	A
Maljamar	B
Pajarito	B

### Recreational Uses:

This site offers recreation potential for hiking, horseback riding, nature observation, photography and hunting. During years of abundant spring moisture, this site displays a colorful array of wildflowers during May and June.

### Wood Products:

This site has no potential for wood products.

### Other Products:

This site is suitable for grazing by all kinds and classes of livestock at any time of year. In cases where this site has been invaded by brush species it is especially suited for goats.

Mismanagement of this site will cause a decrease in species such as the bluestems, black grama, bush muhly, plains brome, New Mexico feathergrass, Arizona cottontop and fourwing saltbush. A corresponding increase in the dropseeds, windmill grass, fall witchgrass, silver bluestem, sand sagebrush, shiny oak and ephedra will occur. This will also cause an increase in bare ground which will increase soil erodibility. This site will respond well to a system of management that rotates the season of use.

**Other Information:****Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month**

Similarity Index	Ac/AUM
100 - 76	2.3 – 3.5
75 – 51	3.0 – 4.5
50 – 26	4.6 – 9.0
25 – 0	9.1 +

**Plant Preference by Animal Kind:**

	Code	Species Preference	Code
Stems	S	None Selected	N/S
Leaves	L	Preferred	P
Flowers	F	Desirable	D
Fruit/Seeds	F/S	Undesirable	U
Entire Plant	EP	Not Consumed	NC
Underground Parts	UP	Emergency	E
		Toxic	T

Animal Kind: Livestock

Animal Type: Cattle

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
little bluestem	Schizachyrium scoparium	EP	D	D	D	D	P	P	P	P	P	D	D	D
sand bluestem	Andropogon hallii	EP	D	D	D	D	P	P	P	P	P	D	D	D
black grama	Bouteloua eripoda	EP	P	P	P	D	D	D	D	D	D	D	P	P
bush muhly	Mulenbergia porteri	EP	P	P	P	P	P	P	P	P	P	P	P	P
sand dropseed	Sporobolus cryptandrus	EP	U	U	U	D	D	D	D	D	D	U	U	U
sand sagebrush	Artemisia filifolia	EP	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
shinnery oak	Quercus havardii	EP	E	E	T	T	T	U	U	U	U	U	U	E
fourwind saltbush	Atriplex canescens	EP	P	P	P	D	D	D	D	D	D	P	P	P
globemallow	Sphaeralcea	EP	N/S	N/S	N/S	N/S	P	D	D	D	P	P	P	

## **Supporting Information**

### Associated Sites:

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
Deep Sand	R042XC005NM	
Sandy	R042XC004NM	

### Similiar Sites:

<u>Site Name</u>	<u>Site ID</u>	<u>Site Narrative</u>
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### State Correlation:

This site has been correlated with the following states: Texas

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
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### Type Locality:

### Relationship to Other Established Classifications:

### Other References:

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Characteristic soils are:	Maljamar fine sand	Pyote loamy fine sand
Berino fine sand	Parjarito loamy fine sand	Wickett loamy fine sand
Berino Loamy fine sand	Palomas fine sand	Wink loamy fine sand
Kinco loamy fine sand	Pyote fine sand	Wink loamy sand



## Literature Cited

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### Site Description Approval:

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
Don Sylvester	07/12/1979	Don Sylvester	07/12/1979

### Site Description Revision:

<u>Author</u>	<u>Date</u>	<u>Approval</u>	<u>Date</u>
David Trujillo	04/30/03	George Chavez	04/30/03